

Application No. 10/586,478

Docket No. R2184.0525/P525

AMENDMENTS TO CLAIMS

1. (Currently Amended) An optical pickup apparatus for shining light on an optical disk having two recording layers and for detecting reflected light from the optical disk, comprising:

- a light source configured to shine the light on the optical disk;
- an optical system situated on a path of a light beam returning from the optical disk inclusive of light reflected by a first recording layer of the optical disk and light reflected by a second recording layer of the optical disk, said optical system including:
 - a light condensing optical unit to turn the returning light beam into a condensing light beam; and
 - a light beam regulating unit to extract from the condensing light beam a partial-cross-section light beam corresponding to only a part of a cross section of the condensing light beam; and
 - one or more photo detectors, situated between a first position where the light reflected by the first recording layer contained in the partial-cross-section light beam is condensed and a second position where the light reflected by the second recording layer contained in the partial-cross-section light beam is condensed, said one or more photo detectors having a first photo detecting section to detect the light reflected by the first recording layer and a second photo detecting section to detect the light reflected by the second recording layer, and the first and second positions being spaced apart from each other along an optical axis of the light condensing optical unit,

wherein substantially no light reflected by the first recording layer reaches the second photo detecting section, and substantially no light reflected by the second recording layer reaches the first photo detecting section that is adjacent to the second photo detecting section, the light shone by the light source on the optical disk being focused on one of the first recording layer and the second recording layer.

2. (Previously Presented) The optical pickup apparatus as claimed in claim 1, wherein said light beam regulating unit is a light splitting unit configured to split the condensing light beam

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into a plurality of light beams, said partial-cross-section light beam corresponding to at least one of the plurality of light beams.

3. (Original) The optical pickup apparatus as claimed in claim 2, wherein the plurality of light beams includes a first light beam and a second light beam, and said one or more photo detectors includes:

a first photo detector having a photo detecting section to detect the light reflected by the first recording layer contained in the first light beam and a photo detection section to detect the light reflected by the second recording layer contained in the first light beam; and

a second photo detector having a photo detecting section to detect the light reflected by the first recording layer contained in the second light beam and a photo detection section to detect the light reflected by the second recording layer contained in the second light beam.

4. (Original) The optical pickup apparatus as claimed in claim 2, wherein said light splitting unit is a light splitting prism.

5. (Original) The optical pickup apparatus as claimed in claim 2, wherein said light splitting unit is a hologram having a first hologram area and a second hologram area, the first light beam being diffraction created by the first hologram area, and the second light beam being diffraction created by the second hologram area.

6. (Original) The optical pickup apparatus as claimed in claim 5, wherein the first light beam and the second light beam are diffractions of different orders.

7. (Original) The optical pickup apparatus as claimed in claim 5, wherein the first hologram area and the second hologram area have respective, different lens functions.

8. (Original) The optical pickup apparatus as claimed in claim 7, wherein the first light beam and the second light beam are diffractions of an identical order.

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9. (Canceled)

10. (Original) The optical pickup apparatus as claimed in claim 1, further comprising a drive unit configured to drive said light condensing unit in a direction of an optical axis of said light condensing unit.

11. (Original) The optical pickup apparatus as claimed in claim 1, further comprising a drive unit configured to drive said one or more photo detectors in a direction of an optical axis in respect of a photo detecting surface of said one or more photo detectors.

12. (Original) The optical pickup apparatus as claimed in claim 1, further comprising an opto-electrical device having a refractive index changing in response to an applied voltage, said opto-electrical device situated on a path of the condensing light beam traveling from said light condensing unit.

13. (Original) An optical disc apparatus for reproducing information from an optical disk having two recording layers, comprising:

said optical pickup apparatus of claim 1;

a signal obtaining unit configured to obtain a signal from a selected one of the two recording layers of the optical disk in response to an output signal of said optical pickup apparatus; and

a reproducing unit configured to reproduce the information based on the signal obtained by said signal obtaining unit.

14. (Original) The optical disc apparatus as claimed in claim 13, wherein said signal obtaining unit is configured to select an output signal inclusive of only the signal from the selected one of the two recording layers among output signals of said optical pickup apparatus.

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15. (Original) The optical disc apparatus as claimed in claim 13, wherein said signal obtaining unit is configured to subtract a signal component corresponding to another one of the two recording layers from the output signal of the optical pickup apparatus.

16. (Original) An optical disc apparatus for reproducing information from an optical disk having two recording layers, comprising:

said optical pickup apparatus of claim 10;

a drive control unit configured to control said drive unit in response to a signal indicative of which one of the two recording layers is selected for reproduction;

a signal selecting unit configured to select an output signal inclusive of only a signal from the selected one of the two recording layers among output signals of said optical pickup apparatus; and

a reproducing unit configured to reproduce the information based on the signal obtained by said signal selecting unit.

17. (Original) An optical disc apparatus for reproducing information from an optical disk having two recording layers, comprising:

said optical pickup apparatus of claim 11;

a drive control unit configured to control said drive unit in response to a signal indicative of which one of the two recording layers is selected for reproduction;

a signal selecting unit configured to select an output signal inclusive of only a signal from the selected one of the two recording layers among output signals of said optical pickup apparatus; and

a reproducing unit configured to reproduce the information based on the signal selected by said signal selecting unit.

18. (Original) An optical disk apparatus for reproducing information from an optical disk having two recording layers, comprising:

said optical pickup apparatus of claim 12;

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a switching unit configured to control the refractive index of said opto-electrical device in response to a signal indicative of which one of the two recording layers is selected for reproduction;

a signal selecting unit configured to select an output signal inclusive of only a signal from the selected one of the two recording layers among output signals of said optical pickup apparatus; and

a reproducing unit configured to reproduce the information based on the signal selected by said signal selecting unit.

19. (Currently Amended) An optical pickup apparatus for shining light on an optical disk having two recording layers and for detecting reflected light from the optical disk, comprising:

a light source configured to shine the light on the optical disk;

an optical system situated on a path of a light beam returning from the optical disk inclusive of light reflected by a first recording layer of the optical disk and light reflected by a second recording layer of the optical disk, said optical system including:

a light condensing optical unit to turn the returning light beam into a condensing light beam; and

a light beam regulating unit to extract from the condensing light beam a partial-cross-section light beam corresponding to only a part of a cross section of the condensing light beam not exceeding half of the cross section as divided by a straight line passing through a center of the cross section; and

one or more photo detectors, situated between a first position where the light reflected by the first recording layer contained in the partial-cross-section light beam is condensed and a second position where the light reflected by the second recording layer contained in the partial-cross-section light beam is condensed, said one or more photo detectors having a first photo detecting section to detect the light reflected by the first recording layer and a second photo detecting section to detect the light reflected by the second recording layer, and the first and second positions being spaced apart from each other along an optical axis of the light condensing optical unit,

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wherein substantially no light reflected by the first recording layer reaches the second photo detecting section, and substantially no light reflected by the second recording layer reaches the first photo detecting section that is adjacent to the second photo detecting section, the light shone by the light source on the optical disk being focused on one of the first recording layer and the second recording layer.